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Can/Should Computers Replace Judges?

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Can/Should Computers Replace Judges?,
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Abstract: Speculates concerning judicial decisionmaking to test, at least theoretically, what some of the implications of jurisprudential advances might be. Proposes as the means of making this test a consideration of whether a computer may be so programmed as to replace the judicial function of judges.

Tags: Jurisprudence, Judicial Decision-Making, Decision-making (Cybernetic Approach)

[pg1277]** I. INTRODUCTION

The most important inquiry in jurisprudence has always seemed to me to be whether it is possible to have the rule of law rather than the rule of persons. In what sense can an abstraction called "law" actually shape the lives and channel the behavior of persons? Does law "dictate" the proper result in a given case even if the judge's personal inclinations would be to award the decision in a different fashion? And how can we tell? Judges are preeminently capable of rationalizing their results and couching them in appropriate-sounding legal phrases. I think that these fundamental questions have always been very close to the main concern of leading legal theorists throughout the ages. Classical writers tended to formulate their investigations under a search for "the definition" of "law," but I believe that what they were looking for was an answer to the question whether "law" is at all possible. More recent theorists of jurisprudence have put aside the metaphysical inquiry into the "definition" of law, at least overtly (H.L.A. Hart, of course, used the term "concept" instead of "definition"), and have attempted to search instead for rules that can be said to "bind" judges. Hart found that the rules which bind judges are "valid" rules that have the proper pedigree under the system's over-all rule of recognition. [FN1] Hart's analysis, however, leaves open a fairly wide ambit for judicial discretion—that is, latitude that the rules of the system given to the judge to decide a given case either for the plaintiff or for the defendant in his discretion. More recent writers, including Ronald Dworkin, Rolf Sartorius, and Kent Greenawalt, have attempted to fill in some of the area left open by Hart, by indicating algorithms for finding some norms on the books that operate to dictate results in cases that Hart thought were within the judge's discretion. [FN2] If one [pg1278] were to adopt Lon Fuller's approach, then all cases would be determinable—but at the cost of departing from the law books and finding some principles and norms "in the air," so to speak. [FN3] But whatever the approach, all of these efforts seem to me to be addressed to the basic and extremely important problem of making law determinable so that someday we might say that we live under the rule of law and not under the rule of persons.

In this article I would like to speculate ahead of present-day judicial decisionmaking to test, at least theoretically, what some of the implications of these recent jurisprudential advances might be. I propose as the means of making this test a consideration of whether a computer may be so programmed as to replace the judicial function of judges. [FN4] In addition, to bring out the implications more sharply, I will ask whether a computer so programmed should be allowed by society to replace judges. What would be gained, and what would be lost? A somewhat hardened, although obviously premature, discussion of costs and benefits might place the entire issue into much sharper focus. I hope it is clear that my purpose in undertaking this exercise is jurisprudential and theoretical, however much I may later appear to be arguing practicalities.

[pg1279] Inasmuch as the issue I address is hypothetical, I will build my argument upon two bold initial premises. First, let us assume that from a jurisprudential point of view the law has been made completely determinable. In other words, we may imagine that Dworkin, for example, has succeeded in finding an algorithm for all rules, principles, policies, and structures in statutes, constitutions, and judicial precedents, so that even the "hardest" cases can be decided according to existing law. Upon this premise, we may then ask what would be lost, or gained, if all legal decisions in cases could be made by computers and not by human judges. Secondly, I will assume, without attempting to prove it, that if a computer is installed as the decision maker in legal disputes we will have achieved the reduction to zero of human "discretion" in judicial decisionmaking. Of course, I must add as a stipulation that the computer shall not be so programmed as to simulate judicial discretion, for it is possible to program a computer to make random decisions by simply adding to the program a random-number generator. Even more remarkably, it is possible to program a computer to simulate human losses of memory or mental blockages or interferences. [FN5] I will rule out such programs, and instead start with a computer that is programmed to make the same decision invariably when given the same parameters (sets of facts).

As a further preliminary matter, let us take a closer look at (or perhaps be introduced to) our computer. Lawyers today tend to be most familiar with information-retrival computers, which are not at all the sort that I have in mind for this essay. In fact, such information-retrieval computers are quite primitive as computers go these days. In the next section we will see a more modern computer at work using the DOCTOR program devised by Professor Joseph Weizenbaum. And if DOCTOR seems sophisticated, I might note that Professor Weizenbaum's computer gave the responses which I will quote in 1965; already a dozen years have since passed in the brief history of the age of the computer.

Our legal decisionmaking computer will be programmed with all the relevant constitutions, statutes, and judicial decisions and opinions of a given jurisdiction. The operator will type in to the computer the "facts" of a given legal dispute. The computer may ask for additional information, in a manner similar to the DOCTOR [pg1280] program that I will cite. Then, when all the facts are plugged in, the computer will respond with a decision in the form of a number, such as 0.476, or 0.0037, or -0.77. A positive number means that the plaintiff wins; a negative number means that the defendant wins. Given the multiplicity of factors, it is unlikely in the extreme that the result will be exactly equal to 0, meaning that neither side wins. But the numerical scores do indicate the degree to which the existing law supports the prevailing party. Thus, a score close to 1.0 means that the law is nearly entirely in favor of the plaintiff; a score close to 0 means that the case is very close, with precedents divided and statutes ambiguous.

Of course, the facts must be determined before they are typed into the computer. No computer presently envisaged can determine truth or falsity of real world events. Thus, any case would first have to have a factfinding procedure, such as a jury determination. Under the United States Constitution, the right to a jury is preserved. However, juries could find the facts specially, and the computer could provide the "law." More likely, typical cases would consist of lawyers for each party typing in the facts they hope to prove to a jury and seeing what the legal

determination would be upon those facts. There would be no element of uncertainty as to what a judge might decide; rather, each side would get the same numerical result from the computer if each side submits the same facts. A lawyer would first plug in the facts that he or she hopes to prove, then the facts the other side might prove; if on both sets the client would win, it would be futile for the other side to continue. If the legal result turns on the facts, however, then the factual determination will determine the eventual result, as each side knows in advance.

What about "mixed" questions of law and fact? Whether a person behaved "reasonably" or "negligently" is a law-fact question, and therefore we might have to decide whether a factfinder can make such determinations or whether they are part of the "law" to be decided by the computer. This problem is difficult to resolve theoretically, but as I shall try to show later, its resolution may depend on the specific uses to which the computer is put. For the only real question is whether one wants the computer to decide law-fact issues; if one does not want the computer to decide such issues, then of course they can be left to the fact-determining body, and the results (e.g., "the defendant drove his car negligently") simply fed into the computer. Obviously this would reduce the scope of the computer's decisionmaking, just as a judge's role is reduced if mixed [pg1281] law-fact questions are left to a jury. But it is clear that such allocations can be made if one wants to make them. [FN6]

Assuming we have such a computer making judicial decisions, what will we have gained and what will we have lost? Although these questions make up the main focus of my inquiry in the rest of this essay, we might start with a very general question as a point of departure: Would we lose a judge's "judgment," and how important would such a loss be to our legal system? Surely computers do not make "judgments" the way humans do, and so we would lose the "human" aspect of legal judgments. But what specifically do we lose when we lose the humanness of judgments? Is human judgment just a euphemism for arbitrariness, discretion, or bias? Suppose a judge has a subconscious bias in favor of litigants who are deferential in manner. Is that the aspect of human judgment that we would want to keep? (We may assume that no computer would be biased in favor of such a quality unless, of course, deferentiality were programmed into the computer. By simply not programming into the computer any such character traits, we can be assured that the computer will be impartial as to them.) But are there other aspects of human judgment that would be lost if computers replaced judges? [FN7] Let us keep this question in mind as we look at the DOCTOR program.

II. An Example From Automatic Psychotherapy

A. *Description of the DOCTOR Program*

Professor Weizenbaum's language analysis program, called DOCTOR, provides an illustration of computer capability as well as an opportunity to evaluate reactions of practicing psychotherapists to the program. [FN8] Many variants of the program are presently available in computer study centers and universities throughout the country, but the following dialogue occurred during a run of the initial program in 1965. A young lady typed her portion of the conversation on a typewriter connected to a computer programmed with [pg1282] Weizenbaum's

DOCTOR program, and the computer's responses (printed here in CAPITALS) were typed out on the computer's typewriter:

Men are all alike.
IN WHAT WAY
They're always bugging us about something or other.
CAN YOU THINK OF A SPECIFIC EXAMPLE
Well, my boyfriend made me come here.
YOUR BOYFRIEND MADE YOU COME HERE
He says I'm depressed much of the time.
I AM SORRY TO HEAR YOU ARE DEPRESSED
It's true. I am unhappy.
DO YOU THINK COMING HERE WILL HELP YOU NOT TO BE UNHAPPY
I need some help, that much seems certain.
WHAT WOULD IT MEAN TO YOU IF YOU GOT SOME HELP
Perhaps I could learn to get along with my mother.
TELL ME MORE ABOUT YOUR FAMILY
My mother takes care of me.
WHO ELSE IN YOUR FAMILY TAKES CARE OF YOU
My father.
YOUR FATHER
You are like my father in some ways.
WHAT RESEMBLANCE DO YOU SEE
You are not very aggressive but I think you don't want me to notice that.
WHAT MAKES YOU THINK I AM NOT VERY AGGRESSIVE
You don't argue with me.
WHY DO YOU THINK I DON'T ARGUE WITH YOU
You are afraid of me.
DOES IT PLEASE YOU TO BELIEVE I AM AFRAID OF YOU
My father is afraid of everybody.
WHAT ELSE COMES TO MIND WHEN YOU THINK OF YOUR FATHER
Bullies.
DOES THAT HAVE ANYTHING TO DO WITH THE FACT THAT YOUR BOYFRIEND MADE YOU COME HERE [FN9]

[pg1283] Obviously a computer that can talk back endlessly in the above fashion might seem almost human. Professor Weizenbaum reports that users of the computer unequivocally anthropomorphized it, and that it induced "powerful delusional thinking in quite normal people." [FN10] His secretary, who had watched him work on the program for months and surely knew it to be merely a computer program, started conversing with the machine. After a few interchanges, she asked Professor Weizenbaum to leave the room. [FN11]

The computer may seem to be "understanding" what people say to it, yet the DOCTOR program itself is simply a language analyzer and a set of rules of how to play back certain words

and keep certain themes running. The program is not unlike those that enable computers to play checkers or chess; they "read" the human player's moves and type out responses that, in the case of checkers, enables computers to beat any human being, and, in the case of chess, enables computers to beat most amateurs and semi-professional players. [FN12]

Professor Weizenbaum selected psychotherapy simply as a convenient sort of illustration for computer language analysis. In particular, he used the Rogerian psychotherapist which in his words "is relatively easy to imitate because much of his technique consists of drawing his patient out by reflecting the patient's statements back to him." [FN13] Yet Weizenbaum was surprised when DOCTOR became widely known, because a number of practicing psychiatrists seriously believed that the program could grow into a nearly completely automatic form of psychotherapy. Doctors Colby, Watt, and Gilbert wrote:

> Because of the time-sharing capabilities of modern and future computers, several hundred patients an hour could be handled by a computer system designed for this purpose. The human therapist, involved in the design and operation of this system, would not be replaced, but would become a much more efficient man since his efforts would no longer be limited to the one-to-one patient-therapist ratio as now exists. [FN14]

[pg1284] In 1965 astrophysicist Carl Sagan wrote that no computer program "is adequate for psychiatric use today, but the same can be remarked about some human psychotherapists." For a few dollars a session, he added, "we would be able to talk with an attentive, tested, and largely non-directive psychotherapist." [FN15] In the next section, I will summarize Professor Weizenbaum's reaction to these enthusiasts of computerized psychotherapy, and then in the following section I will attempt to evaluate his reaction in terms that I hope will be suggestive of analogous considerations for computerized justice.

B. *Professor Weizenbaum's Reaction to DOCTOR Enthusiasts*

In 1976 Professor Weizenbaum, stimulated by his adverse reaction to the enthusiastic reception accorded his own DOCTOR program by practicing psychologists, wrote *Computer Power and Human Reason*. [FN16] He found it nearly monstrous that psychologists could genuinely advocate the substitution of human psychotherapists by a computer. The computer would lack empathy with the patient; it would have no common experience with human problems that could give it insight into the patient's special situation. [FN17] "Computers and men are not species of the same genus," [FN18] he writes. "Man faces problems no machine could possibly be made to face." [FN19] There is, for example, a domain of knowledge that a computer could never know—knowledge involved by virtue of having a human body that is sensitive to external stimuli in a special way. To have a hand, to touch things, to experience a kinesthetic emotion upon touching them, is an experience a computer can never have. [FN20] How could a computer ever know or understand the feeling that two young people in love share when they hold hands? How can a computer know human hopes and fears? "It is hard to see what it could mean to say that a computer hopes." [FN21] In particular, a computer cannot have the fear of death that is so deeply rooted in the human experience. A computer might be so

programmed as to "defend itself" against [pg1285] having someone disconnect its memory bank (this example is not Weizenbaum's, but is the familiar one of the computer HAL in Stanley Kubrick's motion picture 2001), but it still cannot empathize with the fear of, say, a defendant on trial in a capital case. [FN22]

The computer is, in brief, an alien intelligence. [FN23] Weizenbaum concludes that "since we do not now have any ways of making computers wise, we ought not now to give computers tasks that demand wisdom." [FN24] I think we may properly infer from Weizenbaum's position that he would find computerized psychotherapy to be dangerous because it is not infused with a human sense of purpose and directedness, and hence a patient might be encouraged to think along certain lines that could turn out to be harmful to the patient or to others. However, Weizenbaum does not pursue the implications of any such notion of harm, contenting himself to stop with the observation that we should not assign to computers tasks that demand wisdom. But perhaps a fear that computer advice could harm a patient or a third party is answerable in terms of the comprehensiveness and sophistication of the program. A computer could, in principle, be given elaborate moral directives in order to steer the patient away from any contemplated action that would be immoral (or illegal) without, of course, being morally intrusive and offensive. However, since Weizenbaum has not pursued the implications of what a sophisticated computerized psychotherapy program might consist of, I want to turn now to a partial criticism of his argument that is based upon accepting his own premises.

C. *A Critique of Professor Weizenbaum's Position*

My main objection to Weizenbaum's position against the use of computers for psychotherapy is what I feel is his insensitivity to costs. Although it might be desirable for every person needing psychiatric help to see a practicing psychotherapist, the fact is that most people cannot afford the fees. A licensed psychotherapist has had a full medical school education and has also taken additional work, academically and clinically, in psychiatry. Given the expense [pg1286] of such training and the limited number of persons who qualify for such training, there is no foreseeable way that enough practitioners could ever be available at rates the public as a whole can afford to pay. Hence the real choice is not between a human psychotherapist and a computer, as Weizenbaum would have it, but between human/computer psychotherapy and no psychotherapy at all—at least for the majority of persons. There is something of the "if they have no bread let them eat cake" attitude toward the delivery of psychiatric services inferable from Weizenbaum's conclusion.

And if there is a touch of Marie Antoinette, there is also a touch of the benevolent despot. Why should society bar the use of computers for automatic psychotherapy? Simply because some people, such as Weizenbaum, have decided that it would not be wise to let the masses have access to such devices? One could readily imagine that practicing psychotherapists might seek legislation protecting them against this sort of labor-saving automation; the fact that some psychologists have encouraged the use of programs such as the DOCTOR program is, to my mind, highly commendable.

Given the economic realities of our society, it seems to me that the only possible justification for barring the use of computers in automatic psychotherapy would be a demonstration that considerable harm to society would result from the "advice" given by such computers to their patients. But here, as I have noted in the preceding section, is where Weizenbaum's analysis stops. He argues, perhaps romantically, that it would not be "wise" to have computers playing psychotherapist, but he does not show that it would be dangerous. Yet a cost/benefit analysis is clearly called for on the part of those who would ban the use of computers for this purpose. In very general terms, some of the relevant factors in such an analysis would be as follows.

First, one might attempt to assess the benefits of such a program. The fact that many people might want to pay the few dollars necessary for conversing with a computer is itself a strong indication of public benefit. We live in a free market system and to the extent that we believe that people are entitled to spend their money in ways they think best, there is a heavy burden upon those who would argue that public choices of spending money are irrational. Another benefit, which in practice will follow upon the one just mentioned, is that people who keep going back to the computer for more "sessions" may be helped by that fact alone. A person conversing with a computer is at least conversing; he or she is not out doing anything socially destructive. In addition, the patient is thinking [pg1287] and reflecting; to the extent that we believe that conscious thought is helpful in cases of mental problems, then that too is a benefit. Also, the computer is a nonpunitive audience in Skinnerian terms; [FN25] if Skinner is right, the only value of a high-priced psychotherapist is the provision of a nonpunitive listener which the patient somehow "needs" and which makes the patient feel good. Ultimately, the only way to assess the impact of computerized psychotherapy would be to compare the life experiences of those who used the computer and patients of human psychotherapists, double-blinded against people having similar problems who had no help from man or machine.

The costs of the computerized program, in addition to the obvious cost of preparing DOCTOR-type programs and the cost of computer time, would be any excess of the harms resulting from denial of human psychotherapeutic help or the denial of any help at all over the benefits to the patient and to society of computerized psychotherapy. This is a complex assessment to make, but implicit in Weizenbaum's condemnation of computerized psychotherapy is the judgment that some persons are going to be worse off. However, several convincing studies made in recent years conclude that patients of practicing psychotherapists are not significantly improved compared to persons having similar mental or emotional problems who, largely because of poverty, do not receive any medical help. [FN26] Indeed, it has become increasingly difficult to justify classical psychotherapy, as distinguished from chemotherapy or surgical procedures, which have costs and benefits of their own and which are obviously irrelevant as far as computerized psychotherapy is concerned. Of course, the lack of empirical justification for psychotherapy has not hurt the business; many people want to pay the money anyway. Then why shouldn't other or poorer people be allowed to pay less money to have access to a computer?

Having made these arguments, I want to stop short of total advocacy of computerized psychotherapy because of a danger in the procedure that, as I previously suggested, might be

inferable from Weizenbaum's critique. It is possible that a computer might "lead" a patient into taking action that would be harmful to society. To take an extreme and perhaps ridiculous case, suppose a patient [pg1288] discusses with a computer how he would feel better if he dropped botulism germs into a city's water supply. If the computer did not "know" that botulism is one of the most deadly poisons, it might encourage the patient to go ahead if that would make the patient feel good. The computer, of course, would not recognize "botulism" if no one had thought to program it in advance that that word signified a deadly poison. The uncertainty of being able to make a complete program against all such possible risks thus cautions the advocate. It is far too early in the development of computerized psychotherapy to assess such possible costs and consequences. However, the preceding example introduces this note of caution, which is analogous to the considerations I shall be taking up in the remainder of this essay with respect to the notion of computerized justice. As we shall see, I believe that many of the same costs, benefits, and dangers need to be identified as we turn our attention to the implications of a determinable set of legal rules in a society committed to the governance of the rule of law.

III. A Modest Proposal for Dehumanized Decisionmaking

A. *The Choice of Subject Matter*

If computers will ever replace judges, a start must be made somewhere; no legal system will be turned over to the machines wholesale. The choice of initial subject matter for computerized decisionmaking should be such as to promote the system's values without risking the kinds of fears on the part of the public that Weizenbaum expressed in reaction to the enthusiasts of the DOCTOR program. Here, a simple analogy to the psychotherapy situation would not work. I am unaware of any portion of the system of justice where the parties cannot afford the expense of a judge. First of all, judges are not paid by the parties. Secondly, court costs are minimized in small-claims cases, and in some situations where the parties are too poor, the costs are dispensed with entirely. [FN27] Moreover, typical small-claims cases turn on disputed facts, not on complicated legal questions. Factual determinations, even when made by judges without juries, such as in traffic court, take up a lot of the time and cost of the system of justice as applied to people who are poor. Finally, criminal cases, even those involving indigent defendants accused of minor crimes, would be the worst cases for which to try to [pg1289] inaugurate a computer decision-making program. Resistance to it, rational or not, would be extremely high; indeed, in the United States at least, there would be constitutional questions raised about any attempt to have the jury (or a judge sitting in lieu of a jury) give a special verdict, inasmuch as part of the constitutional guarantee of jury trial in criminal cases incorporates a disputed but nevertheless real history of jury nullification—a safeguard that a computer, which must follow the law, would never be able to provide.

Instead, we should look for an area of the law where justice is presently hindered by the large costs involved and where very little would appear to be at risk in substituting a computer for a human decisionmaker. I would suggest the area of law that covers all determinations in advance of determinations of the merits of substantive controversies. In other words, matters of procedure, jurisdiction, venue, and choice-of-law would seem to be appropriate subjects for

computerized decisionmaking. One need merely look at the specialized reporters containing volumes of cases devoted to jurisdiction, procedure, and conflict of laws to get an idea of the enormous amount of judicial time and clients' money devoted to such litigation. Surely this vast expenditure does not serve the aggregate interest of the public; courts that are clogged with such cases have less time for other matters, and parties are subjected to enormous legal fees devoted to nothing more than a determination that the case is in the right court or that the right body of law is being applied. If all these cases could be handled expeditiously by computer, who would be hurt in comparison with the enormous sums saved?

One of the costs, to be sure, would be the loss of income of lawyers especially trained in these areas, and perhaps the loss of some law school courses devoted to them. Certainly lawyers would need some training in these areas due to the need to determine facts to plug into the computers; nothing can dispense with the training lawyers receive in judging the relevance of facts or calculating what facts are worth how much time and energy to establish. But in terms of justice to all, certainly any program that can eliminate a great deal of lawyers' and judges' time and services should not be retarded for that reason alone.

Then why is so much legal time presently spent in the litigation of these areas? Does this amount of time and energy not reflect an aggregate judgment that the law needs to be argued in these presubstantive areas as much as in substantive areas? I think that the reason for the time and money spent in the litigation of procedural issues does not reflect the worth to society of the resolution of these [pg1290] issues, but rather has so far seemed to be a necessity because it is always to the advantage of one side in any given litigation to argue these matters endlessly. There is always one side that has calculated that it has a relatively poorer case on the merits, so that a great deal of litigation on procedural issues might wear the other side down or make for an easier settlement. The other side has no choice but to "litigate back." Nor are the questions necessarily frivolous. Indeed, they go to what we have been conditioned to think are ultimate questions of the court's power to handle a dispute. Judges are typically sensitive to such questions and will listen to extended argument concerning them. Thus the system goes on, and the bill-paying public is the eventual loser.

Nevertheless, sometimes procedural and jurisdictional questions are very important in establishing general guidelines conducive to justice. In the early days of a court's history, in particular, these kinds of questions help to define the nature of the court. Perhaps we would not want to dispense with the judge's own perceptions in the earlier cases involving these basic matters. Similarly, a legal system as a whole in its early days will stake out general, important guidelines. The human participation of the judges involved probably is important in the developmental days.

At some point, however, further development may be too costly in comparison with marginal benefits derived from increasingly fine-tuned decisionmaking on matters of competence and choice of law. Theoretically, refinements are endlessly possible, but are they worth the costs to the parties and the time consumed by the courts? Moreover, there are two basic safeguards; legislation and the highest court. If we had computerized decisionmaking in the areas

of procedure and choice of law, a legislature could still step in at any time and "improve" the system. If lawyers or litigants felt that certain results were irrational, a new law could be passed that would re-program the computer to change that line of cases. Thus, although the computer itself would stop "progress" and further refinement in these areas, a legislature could surely fill that role at any time. Secondly, in the United States at least, the Supreme Court sits by virtue of the Constitution, even though lower courts are not constitutionally prescribed. Short of a constitutional amendment, the Supreme Court could always make basic changes in the rules, such as it did in *Erie*. [FN28] Moreover, a review court could, as a matter [pg1291] of policy, review all lower-court determinations within a certain numerical range, for example, between 0.05 and -0.05. In this very limited range, the cases are so close that the higher court might feel the need for reexamination of the precedents. Of course, the higher court's subsequent decision itself would be programmed into the computer so that all future cases would reflect the new reevaluation. Nor would litigants' expectations be disturbed by such a procedure, for the parties would know in advance that if the facts of the case generate a result between 0.05 and -0.05, a higher court would step in.

B. *A Heuristic Model for Preliminary Consideration*

I now want to indicate in the most general terms how a computer might be programmed so that it could adjudicate a question involving conflict of laws. My purpose is not to sketch an algorithm so that a team of programmers can begin immediately! Nor shall I get involved in the technical aspects of the program, for that would be extremely premature. Rather, I simply want to indicate in the least amount of detail necessary what would go into such a program so that the reader can evaluate concretely what would be gained and lost in terms of our overall jurisprudential inquiry.

Let us suppose that in a given jurisdiction a team of legal researchers want to program a computer to give decisions involving choice of law in cases where it is alleged that a tort took place in a state other than the forum state. Roughly, what they would do would be to extract the facts as reported in judicial opinions in all the reported cases involving this question. These facts would be plugged into the computer on a case-by-case basis, indicating for each case's set of facts the name of the court and which side won the case. The name of the court is important because the highest court in the jurisdiction would be controlling; the computer would be instructed to "scan" all the highest court's cases first and only move to the lower level courts, each level in turn, if the highest court's decisions do not resolve the question at hand. The designation of which side won the case is clearly important because clusters of facts will be correlated, as I will indicate more specifically in a moment, with the prevailing side.

One immediate problem presents itself with the rough summary I have just given: How does the team of researchers know what a "tort" is, inasmuch as there are some areas of law (quasi-contract, for example) where it may be unclear if a "tort" is involved? The way around this problem is to have the team of researchers program [pg1292] *all* the cases ever decided in the jurisdiction. An eventual computer program would do precisely that. In that event, preliminary distinctions would not have to be made; an organizing fact might be something like

"personal physical injury" rather than "tort," but such organizing facts would simply be part of the facts plugged into the computer by the research team and not a preliminary category that would serve to indicate that some cases are to be plugged in and others not. But if a selection is needed to spare the expense of programming all a jurisdiction's reported cases, then perhaps something roughly like "tort" would have to be used. The term should be given the loosest possible definition, so that the research team will "err" on the side of including more cases than perhaps are strictly needed to solve a given problem.

A more difficult task for the research team is choosing the *relevant* facts of a given case. The initial determination of relevancy has, fortunately, already been made by the court. If it were not for this initial determination, the attempt to program facts into a computer might almost be impossible (how could we know, for example, whether the color of the plaintiff's eyes, or the fact that there was an eclipse of the moon three days after the accident, are "relevant"?). But the statement of the facts that a court will include in its opinion serves as the first filter from all the possibly relevant facts, one that narrows the facts enormously. But even that filter is not fine enough, for certain facts, even though reported by the court, will be irrelevant. Here, the question of irrelevancy is a matter for trained legal discernment, but I would not anticipate much difficulty in this regard. Lawyers can easily agree, for instance, that the names of the parties are irrelevant. Thus, the names would not be plugged into the computer. But what about the ages of the parties, if the court mentions their age? It is not immediately clear that the ages are irrelevant; one must look further in the opinion. If anything said by the court in support of its judgment refers to the age of the parties—such as the fact that one party is a minor—then that fact of minority should be plugged in.

The reason it is important for the computing team to discard irrelevant facts is that the computer will be instructed to take all the facts into consideration. We want to avoid the possibility that the computer will find a correlation between, say, the number of letters in a party's name and whether persons of that many letters tend to win cases. Such a correlation would skew the computer's output in a new case where one of the parties might have the same number of letters in his or her name. There is, in short, no substitute [pg1293] for reading each opinion in its entirety, seeing what facts among those the court mentioned appear to be operative in its reasoning, and seeing what facts mentioned by the court but not alluded to in its reasoning courts in other cases have indicated are relevant.

Let me be more specific about the kinds of facts that are relevant. In choice-of-law cases relating to tort, the *Restatement (Second) of Conflict of Laws* says that the following contacts should be taken into account:

(a) the place where the injury occurred,
(b) the place where the conduct causing the injury occurred,
(c) the domicil, residence, nationality, place of incorporation and place of business of the parties, and
(d) the place where the relationship, if any, between the parties is centered. [FN29]

All facts bearing on these matters, clearly, must be fed into the computer.

So far, the computer has been instructed that certain collections of facts are to be associated with a "win" on the part of the plaintiff or defendant. But what about intangible weights to be accorded to various facts? The *Restatement* itself, after listing the facts above quoted, states that "[t]hese contacts are to be evaluated according to their relative importance with respect to the particular issue." [FN30] This sentence is an important illustration of the "judgmental" factor in decisionmaking. How can a computer decide questions of the relative importance of facts to alleged torts? If a person is injured in an airplane, how can the computer know that it is relatively less important what state the plane was flying over at the time of the injury than if a person received exactly the same injury as a guest in a car driven on the roads of that state?

In the first place, the correlation of facts with winning sides will take into account many more facts than those suggested by the *Restatement*. Indeed, if two cases are roughly the same but the foreign law was applied because the injury took place in a plane, and the forum law was applied because the injury took place in an automobile, the computer will automatically find that a difference turns on the plane-automobile distinction. The computer is not judging "relative importance," but rather is specifying exactly what counts; [pg1294] the computer in this sense is more precise than the Restatement's general formula.

Second, the facts plugged into the computer need not necessarily be confined to automobile- plane with respect to the differences between the two cases I have just mentioned; for the court's opinions in those cases may mention the amount of time spent by the parties in the other state where the accident occurred (a very brief amount of time for the airplane case), the relation between the injury and the laws of that state (a stronger relation might exist in an automobile accident because the state's rules of the road apply directly), facts involving the particular geographical conditions of the foreign state (again, road facts count more heavily than shifting wind currents for airplanes), and so forth. All these facts, properly plugged in, will help the computer make distinctions even between other kinds of vehicles (helicopters vs. motorcycles, for instance).

Third, we *might* concede that in some cases a human judge might be able to make a more refined determination than a computer. A human judge might know from intuition that it is somehow more "important" that a certain contact with the foreign state should count with respect to the particular alleged tort at issue than would other contacts. But is this degree of refinement enough to warrant protracted litigation over the issue? Should lawyers engage in lengthy arguments as to the quality of certain contacts with the foreign state, or the nature of the alleged tort, and similar almost medievally intractable problems? Or would it be better to eschew further refinement in this area and instead "freeze" the law to reflect only those factors already programmed into the computer from all existing precedents?

Of course, we are only assuming that a human judge would refine and improve the law. In fact, he may misunderstand existing law and succeed only in muddying it up. His own biases

might intrude; he might "want" the plaintiff to win and thus might find that the state having the more "important" contact with the parties is the one that in fact "has" the law more favorable to the plaintiff. A computer would not have any such biases unless they were programmed in, and we can expect that a team of legal researchers—appointed by the legislature and including perhaps prominent judges—would do no such thing. Even the best-intentioned and most impartial judge might simply be confused by the welter of precedents impinging upon a choice-of-law case. It might be very difficult for him to keep all the factors in mind and to remember what combinations of what factors led previous courts to rule what [pg1295] way. He might not be aided by the arguments of counsel, who themselves might not fully understand the relation of factors to decisions in previous cases or who may be trying to suggest different weight distributions because existing precedents might not help their own case. Again, a computer would have none of these disadvantages. It would remember everything and would always rule consistently. In practice, it could be far more faithful to existing precedents than any judge is capable of being.

Another aspect of the question of what weight should be given to various facts in determining choice of law can be handled by the way the computer program is set up. I have said previously that all of the facts of a given case are programmed into the computer and correlated with the decision in that case. Let us now look at this process in somewhat greater detail. The computer program essentially is that of a multiple regression analysis. [FN31] The dependent variables are "plaintiff wins" (+1) and "defendant wins" (-1); the facts of the cases are independent variables. Facts will, however, differ from case to case. Some cases might be almost "on all fours" with other cases, but the court might mention fewer facts. The result of plugging in thousands of cases, each having, say, about fifty facts, will be enormous clusters of facts associated loosely with whether the plaintiff or the defendant wins. Now suppose a lawyer types in a new set of facts—the facts that he hopes to establish for his client in a contemplated legal action. The facts will consist of the kind of tort, where it (or most of it) occurred, residential questions, the place of relationship between the parties, and many other facts commonly cited by courts in this kind of case. [FN32] The computer will receive all these facts and perform a complex multivariate analysis on them. The facts will be "regressed" to "fit" other clusters of facts previously programmed into the computer. The fit will never be exact; the only question the computer decides is whether the new facts as programmed fit more closely to the same facts as they cluster around the dependent variables "plaintiff wins" or [pg1296] "defendant wins." The measure of their fitness ("least squares" distance or "regression") will be expressed numerically. Thus, if some of the facts lead to the plaintiff winning and other facts support the defendant, the final numerical value will be close to zero.

The dependent variables need not be "plaintiff wins" or "defendant wins." They could just as easily be—and in the foregoing case probably would be—"use the foreign law" or "use the law of the forum state." Or they could be "the court has jurisdiction" and "the court lacks jurisdiction."

A further refinement might be introduced when the facts are programmed into the computer. Some facts might be noted by the court in its opinion as having primary importance;

for example, the place of domicile of the parties. Other facts might have secondary importance; for example, a corporation's principal place of business might exceed in importance its place of incorporation. Nonmetric data analysis can be used to rank these facts in the order of importance accorded them by the court; [FN33] these preference-order rankings can be given weight in the construction of the computer's multivariate equations. The mathematics involved can become extremely complex, since the "fit" in the fact clusters will be multidimensional. However, existing techniques can generate adequate programs for this purpose.

But are there not some aspects of choice-of-law problems that remain intractable for a computer? What about the public policy of the forum? In a typical case where this factor made a great difference, the Supreme Court of Wisconsin overruled a long line of precedents to the effect that the law of the place of the tort or injury determined the law to be applied to the case and substituted the law of the forum state on the grounds of the public policy of the forum. [FN34] Under the law of the place of injury, the guest statute probably would have barred the plaintiff from recovering for an automobile injury, but under the law of the forum recovery was probable. All of the parties, including the liability insurer, were domiciled in Wisconsin, the forum state. The court saw no reason why Nebraska had any overriding interest in preventing the plaintiff from recovering against the Wisconsin insurer and thus held that the *lex loci delicti* (of Nebraska) was repugnant to the public policy of the *lex fori*. How would such a case be programmed into the computer?

[pg1297] The case itself could easily be programmed. Where a guest is suing the driver and the driver's insurance company, where all parties are domiciled in the forum state, and where the accident is an automobile accident, those facts are correlated with a "win" for the plaintiff even though the accident took place in a foreign state. But more generally, how is the "public policy" of the forum to be programmed in?

Perhaps "public policy" in the above case was unfair to the insurer. Perhaps the insurance company did not charge a greater premium because, despite the "liberal" policy of Wisconsin regarding guests, other states had more restrictive policies and therefore accidents that took place out of state would not require compensation. In other words, maybe the court's decision was "wrong" or at least not so obviously "right" that, in order to safeguard the potentiality of such a decision, conflict-of-law cases should not be turned over to computers. Moreover, if the public policy is strong enough, one might expect the legislature to enact the appropriate choice-of-law rule. As I said previously, a new statute would immediately be programmed into the computer, effectively changing and overriding the factual clusters of the judicial precedents to the extent of the words of the statute.

But if we do want to program in "public policy," how could it be done? Certainly any prior judicial mention of a public policy could be programmed in the same way a statute might be. Thus any future case involving an issue that can be characterized by the lawyer typing in the facts to the computer as falling under that public policy would have its outcome determined by the public-policy rule. But often the public policy of the forum is not mentioned until a case comes up where a party alleges that a particular result would be against the public policy of the

forum. Would it be possible to program all the cases of the forum state and instruct the computer that any foreign law that deviates from these cases would be contrary to the public policy of the forum? Clearly not, because such an approach effectively would leave no room at all for application of foreign law. "Public policy" is a matter of weight, not a matter of fact.

The solution I would advocate would be a two-tiered analysis. The first tier would be that which I described earlier, taking into account how the facts of the present case correlate with the clusters of facts of all prior precedents. The second tier of analysis that the computer would make, after typing out a tentative result of the first tier, would be to check the result with all known judicial [pg1298] characterizations of the forum's public policy. This tier too would yield a number measuring closeness of fit between the facts of the submitted case and the facts of those cases announcing or repeating the formula containing the public policy of the forum. But this second number could be understood to be only suggestive to a reviewing court. It would be a heuristic indication of the public-policy argument, with the reviewing court having the final word as to whether this factor will be determinative. In short, what I am advocating here is a combination computer-judge system; the computer makes the initial legal determination, and a judge or reviewing court second-guesses the computer. Perhaps this kind of combination will be most palatable in many situations. After a while, we might expect that the reviewing court would adopt certain guidelines before it overrules the computer—e.g., the second-tier number must fall within a certain range for it to be second-guessable, or maybe the second-tier will be abolished if it is found that the uncertainty engendered by the need for a public-policy factor outweighs its usefulness. Indeed, future students of this subject might conclude that many of the vague and indeterminable formulae that today's courts apply are made possible only because of the indeterminacy and speculative quality of all the other factors when subjected to human evaluation. But computerized justice may reveal that, by according exact specificity to the most important variables—the facts—of any given case, there is less need to add indeterminate variables. As a result, the law can become extremely predictable, vast amounts of money spent in litigation can be saved, and confidence in the impartiality and justice of the legal system will be greatly improved.

IV. EVALUATION

The preceding exercise in speculation may reveal some of the costs and benefits of computerized justice. One of the costs will be a freezing of the precedents. The common law will not develop under a computer regime; rather, all new cases will be decided exactly the same, and the new decisions will not add to the body of case law because they will simply reflect it. But is this not the same objection that has been levelled against all attempts at codification? Bentham inveighed against the indeterminacy of the common law, and his proposed codes certainly rigidified the law to the extent that the codes were unambiguous. [FN35] A computer will be similarly rigid, [pg1299] although it will have the added benefit that close cases will be revealed to be close, thus inviting the legislature to adjust the law in those areas. Surely there is nothing in principle wrong with an active legislature reforming the law, for at least a legislature does it prospectively. The common law, in contrast, "reforms" the law at the expense of the justifiable expectations of at least one of the parties.

A second cost will be to render areas of the law uninteresting. At present, many people are immediately interested, whether financially or from a teaching or research point of view, in conflicts of laws. My suggested computer program will probably invite the wrath of some of these practitioners, who will undoubtedly ask me how I would like it if my subjects of interest were computerized. I suppose that I would reply that my personal likes or dislikes are rather unimportant if our goal is to promote aggregate justice.

A third cost is a sense of dehumanization, particularly if the computer moves toward substantive law. I doubt whether many litigrants will feel the loss if nonsubstantive law is computerized, but they may feel differently if computers start rendering decisions on the merits. I do not foresee that much of this sort of thing can happen. For the real impact of computerization will take place at the pre-trial stage. The computer will be a glorified set of law books, yielding answers to fact situations that the researcher has in mind. Of course, it will be more than that; it can be counted upon to yield definite answers. But if people still want to litigate, there will be plenty of room for litigation as to what the facts of a case are. A party will know that in order to win her case she must prove thirty-five facts and disprove fifteen others; if her opponent only proves sixteen facts, he will win. Both sides reach the same result by plugging the same hypothetical facts into the computer. Hence, both sides know what factual determinations will be needed. Depending upon their perceived ability to prove such facts to a jury, they will proceed or not with the case. Once the jury renders its special verdict, there will be no need to submit the facts again to the computer. That would be a redundant procedure, although it might be done simply as a check. But all the "drama" of the case would be in the fact-determination stage. Hence, the computer would not count as a decisive decisionmaking component any more than a set of law [pg1300] books so counts now. I doubt that the result would be any sense of dehumanization of the law.

A fourth cost, however, might be in the quality of decisions on substantive law. Professor Weizenbaum may be right that the computer's inability to empathize with humans could lead to bizarre results. We probably would always insist upon having a Supreme Court as a safeguard in this respect. Also, it would be wise to proceed very slowly, if the decision is made to start at all. That is why I have argued for computerization in an area of law where legal costs seem prima facie to exceed the benefits of refined and marginal decisionmaking by judges. In this area, the worst a computer can do is perpetuate a mistake regarding a court's jurisdiction, its rules of procedure, or its conflict-of-law rules. I do not believe that litigants would be shocked at the perpetuation of this kind of mistake by computers.

Instead, and this leads us to the "benefit" side of the equation, I think people in general would be pleased at the saving of time and money that would result from computerizing at least the nonsubstantive areas of law. I believe that the man in the street would say that cheap and prompt decisions in this area of law are better than right decisions. I would add, more generally, that "right" decisions on procedural or choice-of-law questions are not "right" if they are extremely costly to come by, for it is a narrow view of "right" to say that doctrinal rightness is worthy of any price no matter how high. Dickens' *Bleak House* describes interminable procedural

litigation that eventually exhausts the assets of the parties. On the other hand, if a person is on trial for his life, then the right decision seems always preferable to a cheap or prompt one. It is not clear, however, that in complex procedural litigation a judge will tend to be more often right doctrinally than a computer, as I have tried to indicate previously.

Another possible benefit is that law might seem more impartial to the man on the street if computers were to take over large areas now assigned to judges. There is certainly some degree of belief on the part of the public that judges cannot escape their own biases and prejudices and cannot free themselves from their relatively privileged class position in society. But computers, unless programmed to be biased, will have no bias. They will give the same result on the same facts irrespective of the race, color, wealth, talents, or deference of the litigants.

By removing a large area of unpredictable "judgment" from the law, society may benefit from a sharply reduced number of litigated [pg1301] cases. There may be fewer judges, fewer courts, fewer attorneys. Fewer cases mean less societal friction. A diminution in the trappings of law may signify greater equality before the law and greater delivery of the equal protection of the law to poor people.

It is not my intent, however, to paint a science fiction picture of a brave new world, a picture which surely many lawyers and judges will find abhorrent. Fortunately, this essay appears in a symposium whose subject matter assures a distinctly limited audience. But to this audience I hope that I have succeeded in indicating some of the considerations that follow from a jurisprudential vision of a determinable legal system.

Footnotes

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[FN1]. H.L.A. HART, THE CONCEPT OF LAW (1961).

[FN2]. *See, e.g.*, R. SARTORIUS, INDIVIDUAL CONDUCT AND SOCIAL NORMS (1975); Dworkin, *Judicial Discretion*, 60 J. PHIL. 624 (1963); Dworkin, *The Model of Rules*, 35 U. CHI. L. REV. 14 (1967); Dworkin, *Hard Cases*, 89 HARV. L. REV. 1057 (1975); Greenawalt, *Discretion and Judicial Decision: The Elusive Quest for the Fetters That Bind Judges*, 75 COLUM. L. REV. 359 (1975). I have made some further observations on the determinability of law as a prediction of judicial behavior in D'Amato, *Elmer's Rule: A Jurisprudential Dialogue,* 60 IOWA L. REV. 1129 (1975).

[FN3]. *See* Fuller, *Human Interaction and the Law*, 14 AM. J. JURIS. 1 (1969).

[FN4]. An interesting article in this vein in McCarty, *Reflections on TAXMAN: An Experiment in Artificial Intelligence and Legal Reasoning*, 90 HARV. L. REV. 837 (1977). In that article, Professor McCarty uses a deductive computer program to deal with one aspect of substantive law, the taxation of corporate reorganizations. The algorithm presented is far more detailed than the sketch I present in the present essay, and indeed TAXMAN is an on-line operating computer program. On the other hand, Professor McCarty's program addresses a task that is conceptually far simpler than the one I propose in the present essay, involving essentially a clarification and direct programming of a subchapter of the Internal Revenue Code and yielding results that follow directly from the classifications programmed. The task I suggest, in contrast, involves a multiple regression "fit" of programmed facts of numerous prior cases (some decisions of which may conflict with others) to a current programmed set of facts. The difference can be illustrated by the sort of answer that the two different approaches would yield. Professor McCarty's computer program would yield a simple "yes" or "no" answer to the question whether a given case fits within the Internal Revenue Code's prescriptions regarding the tax treatment of a given corporate reorganization. My suggestion, on the other hand, would yield a statistic that measures the fit between a current cluster of facts and all the previous cases in the jurisdiction according to whether the cluster signifies a relative "win" for the plaintiff or defendant. Professor McCarty's program is clearly deductive; my suggestion for a computer program approaches what we might call an "inductive" task, even though for the computer the program is determinable and results in a specific summation and not a vague generalization. *See* Part III. *infra*.

[FN5]. *See* Feigenbaum, *The Simulation of Verbal Learning Behavior*, in COMPUTERS AND THOUGHT 297 (E. Feigenbaum & J. Feldman eds. 1963).

[FN6]. A computer programmed with the rules of evidence can even assist in the evidentiary determinations. This point was suggested to me by my colleague, Professor Irving Gordon.

[FN7]. *Compare* McCarty, *supra* note 4, at 876-93, discussing the failure of the current TAXMAN program to capture many of the significant facts about the structure of legal concepts and the process of legal reasoning.

[FN8]. *See* J. WEIZENBAUM, COMPUTER POWER AND HUMAN REASON: FROM JUDGMENT TO CALCULATION 3-4 (1976) (hereinafter cited as COMPUTER POWER).

[FN9]. *Id*.

[FN10]. *Id*. at 6-7.

[FN11]. *Id*. at 6.

[FN12]. "Under a recognized international rating system, the strongest quality that a computer has ever achieved is about 1,900. A good amateur has a rating of 1,600." N.Y. Times, April 2, 1977, at 8, col. 2.

[FN13]. COMPUTER POWER, *supra* note 7, at 3.

[FN14]. Colby, Watt, & Gilbert, *A Computer Method of Psychotherapy: Preliminary Communication*, 142 J. NERVOUS & MENTAL DISEASE 148 (1966).

[FN15]. Sagan, *Comment*, 84 NAT. HIST. 10 (1975).

[FN16]. *Supra* note 7.

[FN17]. COMPUTER POWER, *supra* note 7, at 5-6.

[FN18]. *Id*. at 203.

[FN19]. *Id*.

[FN20]. *Id*. at 208-09.

[FN21]. *Id*. at 209.

[FN22]. There are other areas of difference noted by Weizenbaum, *e.g*., the relatively unexplored and hitherto unprogrammable effect upon human thinking exerted by the right hemisphere of the brain. In the recent and hugely successful movie *Star Wars*, the computers are made to seem quite human. Audiences are shocked, therefore, when a computer responds matter-of-factly to the information that it will be scrapped and destroyed. *See id*. at 214-22.

[FN23]. *See id*. at 223.

[FN24]. *Id*. at 227.

[FN25]. B. SKINNER, SCIENCE AND BEHAVIOR 370-71 (1953).

[FN26]. For a survey of the literature and a bibliography, see Malan, *The Outcome Problem in Psychotherapy Research*, 29 ARCHIVES OF GEN. PSYCH. 719 (1973).

[FN27]. *See* Boddie v. Connecticut, 401 U.S. 371 (1971).

[FN28]. Erie R.R. v. Tomkins, 304 U.S. 64 (1938).

[FN29]. RESTATEMENT (SECOND) OF CONFLICT OF LAWS § 145 (1971).

[FN30]. *Id*.

[FN31]. *See* W. COOLEY & P. LOHNES, MULTIVARIATE PROCEDURES FOR THE BEHAVIORAL SCIENCES (1962), and bibliography therein.

[FN32]. Suppose a lawyer does not know what facts to plug in? As soon as he types in any facts at all—for example, the most rudimentary description of what allegedly occurred—the computer can be programmed to ask further relevant questions (as in the DOCTOR program). In this question-and-answer manner, all the potentially relevant facts can be elicited. Admittedly, this refinement even further reduces the role of the lawyer (and his fees), though of course the need remains for the lawyer to prove the alleged facts later in court.

[FN33]. *See* C. COOMBS, A THEORY OF DATA 444-95 (1964).

[FN34]. Wilcox v. Wilcox, 26 Wis. 2d 617, 133 N.W.2d 408 (1965).

[FN35]. For an expansion of this point, see D'Amato, *Towards a Reconciliation of Positivism and Naturalism: A Cybernetic Approach to a Problem of Jurisprudence*, 14 W. ONT. L. REV. 171, 175-76 (1975).